MCP4021/22/23/24 - Digital Potentiometer Product Family

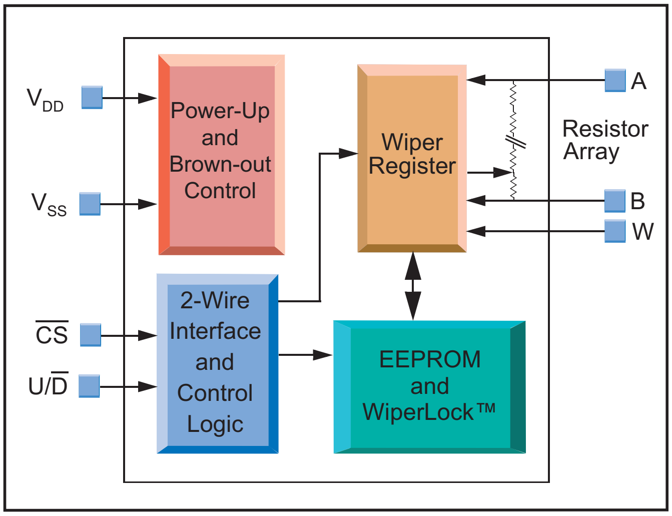
Product Summary:

The Microchip Technology MCP402X family of non-volatile digital potentiometers combine performance and low-power consumption in micro-size packaging, making them ideal for a wide variety of low-power and space-constrained applications.

The MCP402X devices are non-volatile, 6-bit (64 wiper steps) digital potentiometers that are programmed (or reprogrammed) through a simple up/down serial interface. The MCP402X devices offer a variety of configurations that simplify design while minimizing cost, package size and pin count. The MCP4021 device offers a voltage divider (potentiometer) with all terminals available on pins. The MCP4022 is a true rheostat, with both nodes of the resistor available on pins. The MCP4023 device offers a voltage divider, with one terminal connected to ground. The MCP4024 device is a rheostat mode device, with one terminal of the resistor connected to ground. These devices offer the WiperLock™ technology, which utilizes a unique technology that provides the user unlimited reprogramming and locking of the wiper setting. This feature is useful for equipment that requires factory trimming, calibration or recalibration. The MCP402X family of devices are available with resistor values of **2 kΩ**, **5 kΩ**, **10 kΩ** and **50 kΩ**. These devices operate from a single 2.7V to 5.5V supply and, while operating in the static state, draw less than 1 µA.

The MCP402X allows customers to replace mechanical potentiometers in their designs, resulting in added flexibility, in-system programmability and lower lifetime cost. In addition, engineers will find the performance and price of the MCP402X family very attractive.

Microchip is offering a comprehensive set of support tools including application notes, evaluation boards and user's guides.



Features:

- Non-volatile Memory (EEPROM)
- 64 taps – 63 resistors
- Simple Up/Down protocol
- Static Current: 1 µA max
- Automatic recall of wiper settings on power-up
- Resistance values of 2 kΩ, 5 kΩ, 10 kΩ and 50 kΩ
- Wide temperature range: -40°C to +125°C
- Secure wiper using WiperLock™ Technology
- Micropackages: SOT-23 and 3x2 DFN

Additional Information:

- AN219, "Comparing Digital Potentiometers to Mechanical Potentiometers", DS00219, 2000
- AN691, "Optimizing Digital Potentiometer Circuits to Reduce Absolute and Temperature Variations", DS00691, 2001
- AN692 "Using a Digital Potentiometer to Optimize a Precision Single Supply Photo Detect Circuit", DS00692, 2001
- AN737 "Using Digital Potentiometers to Build Adjustable Filter", DS00737, 2004

MICROCHIP
Mixed Signal Analog

Digital Potentiometer Family									
Product	# of Channels	Resolution Bits	Resistance	Interface	INL Lsb (typ)	DNL Lsb (typ)	Static I_{DD}	Operating Voltage (V)	Package
MCP41010	1	8	10	SPI™	0.25	0.25	1µA	2.7-5.5	PDIP-8, SOIC-8
MCP41050	1	8	50	SPI	0.25	0.25	1µA	2.7-5.5	PDIP-8, SOIC-8
MCP41100	1	8	100	SPI	0.25	0.25	1µA	2.7-5.5	PDIP-8, SOIC-8
MCP42010	2	8	10	SPI	0.25	0.25	1µA	2.7-5.5	PDIP-14, SOIC-14
MCP42050	2	8	50	SPI	0.25	0.25	1µA	2.7-5.5	PDIP-14, SOIC-14
MCP42100	2	8	100	SPI	0.25	0.25	1µA	2.7-5.5	PDIP-14, SOIC-14
MCP4021	1	6	2,5,10,50	U/D	0.25	0.25	1µA	2.7-5.5	2x3 DFN, MSOP-8, SOIC-8
MCP4022	1	6	2,5,10,50	U/D	0.25	0.25	1µA	2.7-5.5	SOT23-6
MCP4023	1	6	2,5,10,50	U/D	0.25	0.25	1µA	2.7-5.5	SOT23-6
MCP4024	1	6	2,5,10,50	U/D	0.25	0.25	1µA	2.7-5.5	SOT23-5

Development Tools for Analog and Interface Products from Microchip

INTERFACE PRODUCTS

MCP2140 IrDA® Standard Wireless Temperature Demo Board	Demonstrates the MCP2140 IrDA® protocol controller in a data-logging application.
MCP2120/2150 Developer's Kit	Infrared products developer's kit.
MCP215X Data Logger Demo Board	Demonstrates the MCP2150 IrDA® protocol controller in a data-logging application.
MCP23X08 Evaluation Board	Demonstrates simple input/output functionality of the MCP23008 and the MCP23S08.
MCP250XX CAN I/O Expanders Developer's Kit	MCP250XX CAN evaluation/development tool.
MCP2510 CAN Developer's Kit	MCP2510 CAN evaluation/development tool.

LINEAR PRODUCTS

MCP6SX2 PGA Thermistor PICtail™ Demo Board	Utilizes a photodiode, op amp and PGAs in a thermistor application.
MCP6S22 PGA PICtail™ Demo Board	Demonstrate firmware integration between the PIC®MCU and Microchip's PGAs.
MCP6S2X PGA Photodiode PICtail™ Demo Board	Demonstrates Microchip, opamps and PGAs in a transimpedance application.
MCP6S2X PGA Evaluation Board	PGA devices interface to PIC® microcontrollers (MCU), providing selection of input channels and gains to evaluate device performance.

MIXED SIGNAL PRODUCTS

Mixed Signal PICtail™ Evaluation Board	Enables concise evaluation of several Microchip's DACs, ADCs, LDOs, VREFs and op amps.

POWER MANAGEMENT PRODUCTS

MCP1601 Buck Regulator Evaluation Board	Demonstrates Microchip's MCP1601 synchronous buck regulator.
MCP1612 Synchronous Buck Regulator Evaluation Board	Features Microchip's 1A 1.4MHz synchronous buck regulator in two buck converter applications.
MCP1630 + 12V in Dual Output Buck Converter Reference Design	Dual output programmable power supply capable of 20A per output.
MCP1630 NiMH Battery Charger Demo Board	Combines MCP1630 and PIC16F818 to develop a NiMH battery charger w/ fuel gauge capability.
MCP1650 Boost Controller Evaluation Board	Demonstrates the MCP165X product family in two high-power, boost-converter applications.
MCP7382X Li-Ion Battery Charger Evaluation Board	Features three circuits utilizing the MCP73826, MCP73827 and MCP73828 devices.
MCP7384X Li-Ion Battery Charger Evaluation Board	Features three circuits utilizing the MCP73841, MCP73842 and MCP73843 devices.
MCP7386X Li-Ion Battery Charger Evaluation Board	Evaluate simple, stand-alone, linear charging of Lithium-Ion/Lithium-Polymer battery packs.
SOT-23-3 Voltage Supervisor Evaluation Board	Many SOT23-3 devices may be evaluated using this board.
SOT23-5/6 Voltage Supervisor Evaluation Board	Many SOT-23-5/6 devices may be evaluated using this board.

THERMAL MANAGEMENT PRODUCTS

MCP9800 Temp Sensor PICtail™ Demo Board	Interfacing the MCP9800 to a PICmicro® MCU using PICkit™ 1 Flash Starter Kit as a platform.
TC64X/TC64XB Fan Speed Controller Demo Board	Evaluation/prototyping brushless DC fan control circuits using the TC64X BDC fan controllers.
TC650 Fan Controller Demo Board	Allows user to quickly prototype fan control circuits with TC650 or TC651 PWM fan control ICs.
TC72 Digital Temperature Sensor	Demonstrates how to interface the TC72 temperature sensor to a microcontroller.
TC74 Serial Digital Thermal Sensor Demo Board	Demo board for TC74 digital thermal sensor.
TC77 Thermal Sensor PICtail™ Demo Board	Demonstrates how to interface the TC77 to a microcontroller.
TC1047A Temp-to-Voltage Converter PICtail™ Demo Board	Demonstrates how to interface the TC1047A to a microcontroller.

Visit our web site at www.microchip.com for additional product information and your local sales office.

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